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# PATENT



## SPECIFICATION

Convention Date (Australia), Jan. 13, 1916.

Application Date, (In the United Kingdom), Jan. 8, 1916. No. 381/16.

*Complete not accepted*

# COMPLETE SPECIFICATION

## Improvements in Trench or Pit Howitzers

ALL FRANCES HANCOCK WALLIS of Spearman Street, Chatswood, near Sydney, in the State of New South Wales and Commonwealth of Australia, do hereby declare the nature of this invention and in what manner the same is to be particularly described and ascertained, in and to the following words:

closed and the firing mechanism uncocked as immediately after firing and before the ejecting movement has commenced and Fig. 5 is a sectional plan of same on line 5/5 in Fig. 4. Fig. 6 is a longitudinal sectional elevation of the breech shewing the breech open and the firing mechanism cocked and Fig. 7 is a sectional elevation of the same on line 7/7 in Fig. 4. Figs. 8, 9 and 10 are front elevation plan and section respectively of the ring base clamp.

The barrel or tube 13 having a spanner taking end 14 is screwed into the nozzle end 15 of concentric jacket 16 and into the boss 17 of the breech wall 18 and the jacket 16 also screws into the flange 19 of the breech wall leaving an annular water space 20 between and at the breech completely surrounding said barrel or tube 13. This barrel or tube 13 is removable by screwing it out of the end 15 and boss 17 and thus another like barrel or rifled or smooth bore barrel may be interchangeably used. Exteriorly the jacket 16 is held within a cradle 21 and preferably has a plurality of longitudinal guide ribs taking into complementary guide grooves 22 not shown except in Fig. 3 and in said jacket are orifices to which pipes 23 and 24 in communication with a water reservoir 25 are lead. The cradle 21 has trunnions 26 in bearings on the upper end of vertical side frames 27 bolted to ring base 28, and stayed by cross bars 29 and diagonals 30. Said diagonals 30 at the upper end are bolted to the side frames 27 and at their lower end are adjustably secured to the ring base 28 by screw bolts 32 and are adjusted transversely on said ring base 28 by push screws 33 through lugs 34 on said ring base. The ring base 28 has radial arms or spokes 35 to a central boss 36 bearing on collar 37 upon vertical axis 38 having a bolt or square head 39 and screw threaded into a foot bracket 40. This ring base 28 bears on and within lower parallel ring or foundation ring 41 which is preferably of channel section with inner face complementary to the face of the ring base 28 ensuring true centring and providing for adjustment to make a close fit. An extension piece 42 is screw bolted to the ring base 28 through one or other of the sets of holes 43 tapped diametrically opposite one another and this extension piece 42 has enlarged head 44 with contact sockets therein. The foundation ring 41 has bolted to it a catch ring 45 with part cut away at 46 (see Fig. 2) to allow a pair of clamp blocks 47 to be positioned thereon. These clamp blocks 47 are connected together by bridge 48 and are adapted to travel around the ring 45 and to be clamped thereto at arbitrarily fixed positions by screws with capstan heads 49 set radially of the ring base 28 and bearing on liners 50. Adjusting screws with capstan heads 51 are screwed through the heads 60 of the clamp blocks 47. The ring base 28 has a vernier index 52 thereon preferably graduated in degrees and minutes in a rabbet of said ring base which rabbet allows of readings of the graduations or markings on the outer edge of the face of the foundation ring 41. A movable yoke 53 is secured to the front face of the side frames 27 and it has a boss 54 with a female thread in mesh with male thread 55 on collar 56 loose upon the extended boss 57 of hand wheel 58 having a nut 59 on its free end and a female thread in it to engage threaded rod 60 the inner end of which is jointed to lug 61 on cradle 21.

When the nut 59 is jammed against the loose collar 56 it tightens said collar about the screwed threaded boss 57 and a differential or slow screw motion about the screw 60 results and enables accurate setting of the angle of elevation of the barrel which angle is checked by reference to an index quadrant 61 over which travels an arm or pointer 62 see Fig. 3.

The breech piece carries in a lug 77 a rod or stem 63 which passes into a cylinder 64 parallel to the axis of the barrel 13 in which cylinder is a recoil spring 65 and upon recoil of jacket 15 with the barrel 13 after discharge of the gun this spring 65 is adapted to compensate therefor and returns these parts to normal position in the cradle 21.

The breech sliding block has lugs 66 slidable in guide grooves 67 in breech cheeks 68 and contains within it the firing and ejecting mechanism. The

closure block 69 and the back plate 70 are secured to the sides by countersunk rivets so that together they all form the one block 71 the front face of which is rectangular to the axis of the barrel 13 and its rear face widens therefrom downwardly and outwardly. The closure block 69 has a rear recess in it for the striker head 72 and it has forwardly a central orifice 73 for the firing pin of striker 74. Rearwardly the head 72 has a brace or loop 75 receiving the upper end 76 of a bell crank on axis 77 whose one member is the cocking lever 78 and whose other member is the duplicate arms 79 between which lies the curve or loop of the striker spring 80 on fixed pin 81 in the block 71 while its upper extremity 82 inclines forwardly and is rounded off to fit into a recess in the striker head 72.

Two extractors 83 are set in recesses 84 upon the inner end of screws 85 one on each side of the closure blocks and each has two arms the longer one 86 extending upwardly and having a projection 87 taking into recess 88 in the breech end of barrel 13 to engage the rim of the cartridge which takes into peripheral groove 89 therein and the shorter arm 90 projects backward and has lugs taking in grooves 91. Each arm 90 has a nib 92 to engage with projections 93 on the block 71 and so receive a sharp or quick motion to cause the extractors 83 (for which clearance or recesses are provided in blocks 69 and 71) to eject the cartridge case rearwardly from the barrel 13 after the firing.

The breech lever 94 is jointed to lug 95 on the water jacket 16 and it is connected to the block 71 by a link 96 and has at its back an operating handle 97 preferably integral therewith and this handle is bored to house an adjustable spring catch 98 adapted to take into recess 99 in extension piece 100 secured to breech cheeks bridge by screw 101 and this lever 94 has a stop 102 on it adapted to contact on the angle of block back 70 so as to prevent the block 71 from being pushed too far in. Rearwardly the striker head 72 has a loop 75 to receive the upper end of a bell crank whose boss 104 is on axis pin 77 one member of which is the cocking lever 78. This loop 75 has side wings or lugs 107 taking into guide grooves 108. The other member of the bell crank is duplicate arms 79 extending forwardly to contact with stop 110 when the block 71 moves downwardly after the expulsion of the charge from the barrel 13 and cocks the firing mechanism said stop 110 being slotted to allow the passage therethrough of the striker spring 80 of the firing mechanism.

On the bottom of the boss 104 of the bell crank is a cock notch 111 adapted to engage the nose 112 of trigger 113 pressed forward by leaf spring 114 in recess 115 of block back 70 so as to retain lever 78 in the cocked position. The block back 70 is made or shaped so that the cocking lever 78 will contact and bear against it and thereby limit its back movement when the block 71 falls, and said trigger 113 has an eye 116 at the bottom end through which a lanyard may be passed.

There is a hole 117 in the stop 110 for the insertion therein and to hold the end of a pointed die or pin or tool so that the striker 74 may be re-cocked after such insertion in the event of a miss fire without ejecting the cartridge from the gun.

In action the clamping screws 49 being loosened the gun is laterally directed by revolution of the ring base 28 on the foundation ring 41 and in this connection slow and accurate final setting is ensured by the rotation of the tangent screws 51 which are operated to slowly move the ring base 28 by pressing against the tail piece 42 in the required direction. In this revolving movement the central axis 38 may be rotated to reduce the frictional resistance of the ring base 28 on the foundation base 41. Said screws 49 are tightened to clamp the structure with the gun pointing in the desired direction. The elevation of the gun is adjusted by rotation of the hand wheel 58 and checked by index quadrant 61. For the first charge the breech is opened by manually pressing down the lever 94 until the cock notch 111 of the cocking lever 78 engages the nose 112 of the trigger 113 as shown in Fig. 6 the cartridge is pushed

through the breech block 71 into the barrel 18 until its rim comes into contact with the extractors 83. The lever 94 is then pulled up until the spring catch 98 engages with the recess 99. Upon pulling up the lever 94 the block rises and the bevel on its front face forces the cartridge home and the inclination of the guide grooves 67 in the breech cheeks 68 carries said block forward so as to give a firm bearing against the back of the cartridge and retain it in position. When the breech block 71 is closed or fully up the firing hole 73 and the striker 72 is opposite the cap of the cartridge. On putting the lanyard which is passed through the eye 116 the cock notch 111 is released and the spring 80 freed from control of the cocking lever 78 so that the striker 72 will be moved sharply forward on to the cap of the cartridge. The reaction of the explosion starts the descent of the breech block 71 removing it from the control of the spring catch of the handle. During its descent block 71 is carried slightly to the rear due to the inclination of the groove cut in the breech cheeks and this gives space for the unseating and ejection of the cartridge case. The violent opening of the breech is cushioned by breech spring 80 acting to check the fly back when the arms 90 of the cock lever reach the stop 110, and the block will be brought to rest.

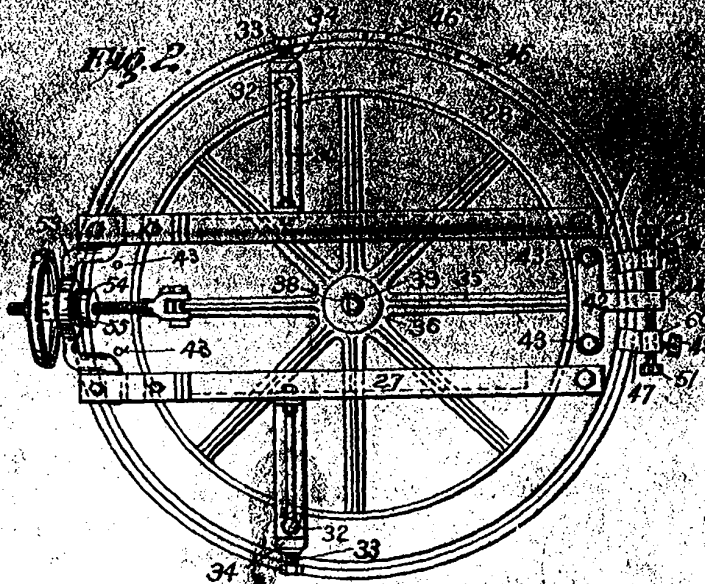
Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a trench howitzer a tube or barrel and a concentric jacket about same leaving an annular water space between and a breech piece to which said tube or barrel and jacket are removably and interchangeably secured substantially as herein described and explained.
2. In a trench howitzer the firing and ejecting mechanism contained in a downwardly movable breech block in a rear housing adapted to be operated by the reaction pressure of explosion of a charge over coming a spring catch substantially as herein described and explained.
3. In a trench howitzer firing mechanism consisting of a striker operated by a spring a cocking lever and a trigger for controlling said striker all housed in a slidable block and a lever and catch mechanism for operating the block substantially as herein described and explained.
4. In a trench howitzer a mounting consisting of side frames joined transversely and having adjustably positioned struts for centring the axis of the gun and firmly holding said mountings substantially as herein described and explained.
5. In a trench howitzer a rotatable support consisting of an upper ring and a lower or foundation ring and central lifting gear as a wheel supported upon a central axis substantially as herein described and explained.
6. In a trench howitzer with revolving ring base as claimed in preceding Claim 4 clamping mechanism with tangent screws adapted on rotation of screws to give a slow revolving motion to the ring base substantially as herein described and explained.
7. In a trench howitzer elevating gear having a loose female screw and a clamping nut to tighten the same so as to adapt it to have a differential or slow motion substantially as herein described and explained.
8. A trench howitzer comprising the mechanical parts or integers constructed and arranged and operating as and for the purposes set forth substantially as herein described and explained and as illustrated by the accompanying drawings.

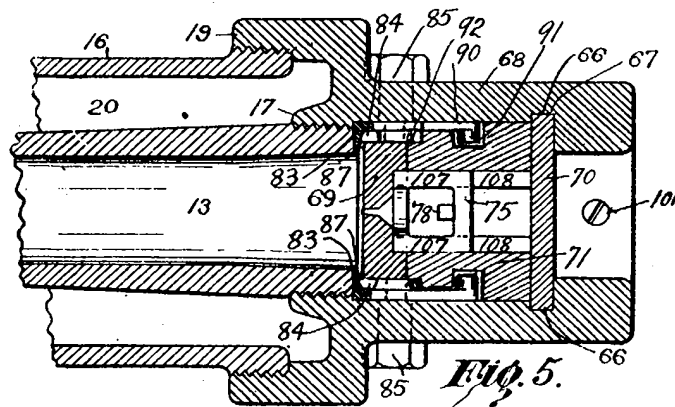
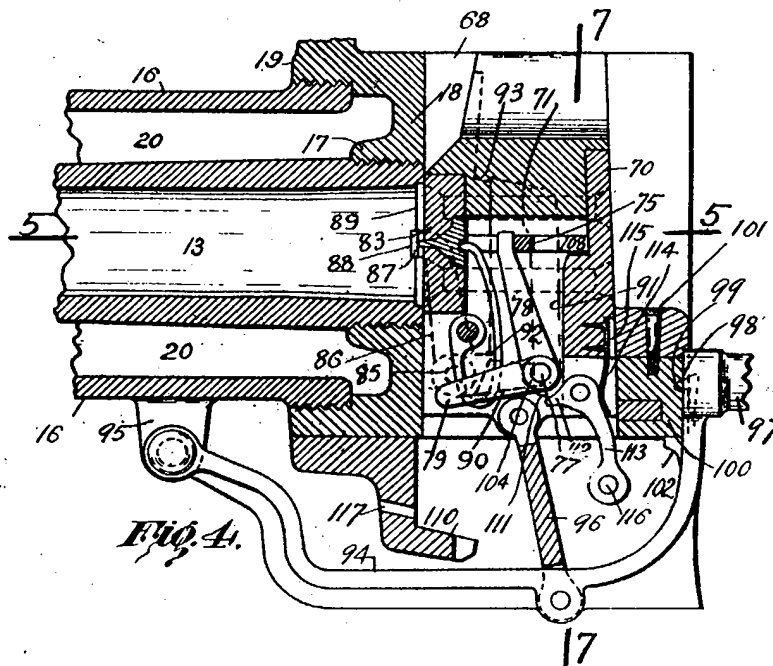
Dated the Twenty-ninth day of November, 1915.

H. D. FITZPATRICK & Co  
Chartered Patent Agents,  
94, Hope Street, Glasgow.

Jan. 8, 1916



Barrel & water jacket  
removable screw to be, piece



150 C16

(5 SHEETS)

SHEET 4

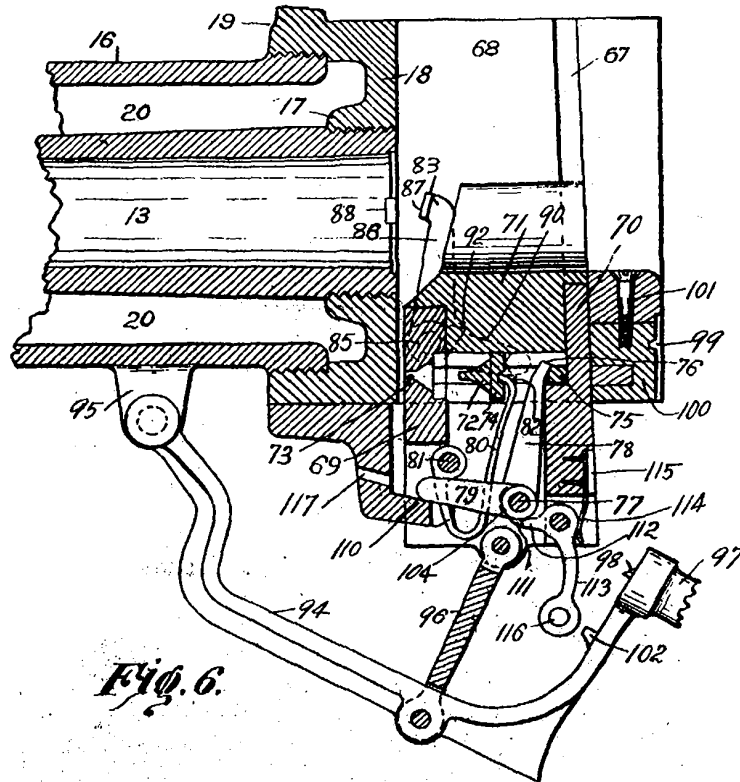


Fig. 6.

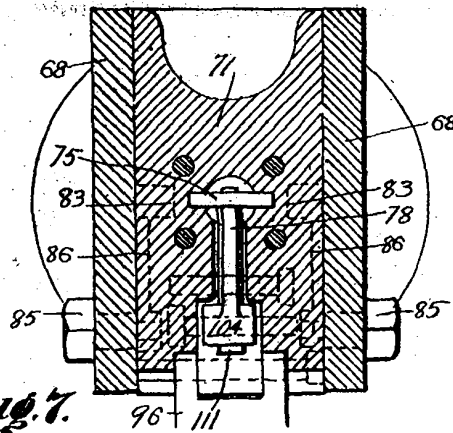


Fig. 7.

